DOCUMENT RESUME

ED 246 028 SP 024 895

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TITLE Time as an Element of School Success.
PUB DATE Mar 84
NOTE 20p.; In: Egbert, Robert L., Ed., and Kluender, Mary M., Ed. Using Research to Improve Teacher Education: The Nebraska Consortium. Teacher Education Monograph No. 1. (SP 024 888), p89-107.
PUB TYPE Information Analyses (070)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Academic Achievement; Classroom Observation Techniques; Classroom Research; Elementary Secondary Education; Program Length; Research Utilization; *School Administration; Student Behavior; Teacher Education; *Time Factors (Learning); *Time Management; *Time on Task

ABSTRACT

An overview of research studies on the relationship among time factors and student achievement is presented. The California Beginning Teacher Evaluation Study is cited as a seminal work in this area. A brief summary of findings on allocated time, engaged time, and academic learning time includes a discussion on how these studies have been expanded and refined by further studies. A discussion on how the "time for learning" concept has become a mechanism for studying other dimensions of the educational experience refers to studies on collective bargaining, bilingual education, mainstreaming, high and low achievement, minority and disadvantaged groups, nontraditional settings, and reading instruction. An analysis is presented of the problems and difficulties associated with observation as a research methodology in studying academic learning time. Implications for teaching are considered and some recommendations are made on ways in which the time-on-task concept can be used for the improvement of education. The concluding discussion offers suggestions on how time-on-task research can be integrated with other forms of research in teacher education programs. (JD)

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ED246028

Time as an Element in School Success

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Psychologists interested in the learning process always have considered time, or number of repetitions, to be a potentially important variable in the amount of learning that occurs. In some studies psychologists have made time (repetitions) an independent variable, while in others they have controlled for time or repetitions, but they have never ignored the issue. (See, for example, Thorndike, 1931; McGeoch, 1942.) Educational psychologists who have extended laboratory studies of rats, pigeons and people to classroom and school research have likewise considered time an important variable and have either made it an independent variable, or have controlled for it. (See, for example, Forlano, 1936; Frandsen, 1957).

Educational curriculum planners also usually have appeared to think of time as an important variable in learning, as when they have assigned more elementary school time to tool subjects, e.g., reading and arithmetic, than they have to such subjects as music and physical education, without regard for the time required to acquire mastery. That is, by assigning relatively more time to reading and arithmetic than to music and physical education, curriculum planners have demonstrated that they value elementary school children achieving mastery of reading and arithmetic more than they do similar mastery of music and physical education. However, curriculum planners at other times have appeared unaware of the importance of time in the learning process and of the research evidence demonstrating that time is an important variable in learning. An example is when they have subtracted from the elementary school time devoted to tool subjects, rather than lengthening the school day, in order to provide a broadened curriculum.

Within the last few years, almost unrelated events and concerns have taken place in educational research and in educational planning that have caused school time to become a high priority issue. In educational research, three important documents were published: (1) John Carroll's theoretical paper (1963) stating that the degree of learning that occurs is a function of the amount of time spent learning divided by the amount of time required

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for learning, (2) Coleman's suggestion (1966) that the nature of schooling does not make a difference in educational outcomes, and (3) Wiley and Harnischfeger's analysis (1974) of a sixth-grade sample of Coleman's Detroit Metropolitan Area data in which they found that amount of schooling (attendance x length of school day x days in school year) bore a substantial relationship to school achievement. The Wiley and Harnischfeger analysis and model, which at least partially refuted Coleman's conclusions, began a revolution in the way educational researchers thought about the instructional process. More recent research has established further support for the Carroll and Wiley-Harnischfeger models, e.g., Karweit and Slavin (1981), Daniels and Haller (1981).

In educational planning there was not an easily identified set of publications or events that began the trend of concern about how school time is spent; instead, there developed a gradually spreading concern that one reason for lowered achievement scores was a diffusion of the curriculum in which less time was spent on such essential subjects as English, mathematics and science in order to allow time for elective subjects (Harnischfeger, 1980; *A Nation at Risk*, 1983).

The single most important research base for the present interest in the assignment and use of school time is the California Beginning Teacher Evaluation Study (BTES). Initiated in 1970 to identify generic teacher competencies and evaluate teacher education programs through follow-up of their graduates, this project continued for almost ten years and conducted broad ranging research concerning teacher and student behaviors and student achievement, largely in the classrooms of experienced teachers. Academic Learning Time, the amount of time the student spends in an academic task that s/he can perform with high success, became a central concept in the research (Powell, 1980; Fisher et al., 1980).

The Time to Learn Concept

Over the past ten years, several measures of school time have been designed. Each one is important for different dimensions of research and practice, but not all of those that are important for research or for school district management are critical for understanding what takes place in a specific classroom. Thus, information produced in the Wiley-Harnischfeger model (1974) mentioned earlier, which refers to quantity of time available for the teacher, is useful to researchers studying the achievement value added by increasing the quantity of time available for learning and to school boards and school administrators who are interested in raising achievement levels in their schools, but it lacks the detail necessary for either building or classroom analysis. However, several other studies have used definitions useful at the classroom level.

The BTES is an example of a study using time definitions useful in classrooms. The BTES used three measures of time—allocated time (the amount of time allotted to the teaching of a given subject), engaged time (the

amount of time that a child/student is on task), and academic learning time (Rosenshine, 1980). Each of these measures describes time at a more restricted level of generality than the three components of the Wiley-Harnischfeger model. A comprehensive model that includes elements from both levels of generality might have at least five components:

1. *Assigned time*—the amount of time that the school district determines is available for the school. (Length of school day x days in school year.)
2. *Average daily attendance*—as a percent of the potential.
3. *Allocated time*—the amount of time that the teacher or the school allots to a given content area. This might be a year-long allocation for a subject area or it could be the amount available for a unit or topic within the subject area.
4. *Engaged time.*
5. *Academic learning time.*

Each of these measures or components varies across districts, schools and classes. In fact, one of the more immediately usable results from the time-to-learn research is knowledge of the wide variation from school to school and class to class on the different measures of time. This has permitted researchers and practitioners to view classrooms in the context of both average time and ranges of time.

Dimensions of the time variation have been described by a number of authors. Examples are:

1. As reported by Harnischfeger and Wiley (1976), Mann (1928) summarized daily mean subject area time allocations in minutes. For the third grade, these were: reading—70.4; language—62.8; social studies and science—31.8; arithmetic—39.2; arts—33.4; physical education and recess-38.0; general—7.4; and nonacademic—24.4.
2. Wiley and Harnischfeger (1974) reported a range in the amount of time available for sixth-grade classroom teachers as ranging from 710 to 1150 hours.
3. Rosenshine (1980) summarized BTES data (Table 1, below) as showing that, at the second-grade level, the allocated, in-class time was divided into (a) two hours and fifteen minutes (fifty-seven percent) for academic activities, (b) fifty-five minutes (twenty-four percent) for nonacademic instructional activities, and (c) forty-four minutes (nineteen percent) for noninstructional activities. At the fifth-grade level, these times were two hours and fifty minutes (sixty percent), one hour and five minutes (twenty-three percent) and forty-five minutes (seventeen percent) respectively.

Table 1
Average Allocated Time per Day in Different Activities

	Grade 2		Grade 5	
Time Category	**Minutes**	**Percentage**	**Minutes**	**Percentage**
Academic Activities	2'12"	57%	2'51"	60%
Nonacademic Activities	55"	24%	1'05"	23%
Noninstructional Activities	44"	19%	47"	17%
Major In-class Time	3'51"	100%	4'44"	100%

*Adapted from Rosenshine (1980)

In addition to the in-class time, Rosenshine also reported approximately one-and-a-quarter hours for lunch and breaks, bringing the average second-grade day to just over five hours in length; the sixth-grade day to approximately six hours.

4. Within the overall allocated time in the BTES, there was considerable variation among teachers. This is shown in Table 2 (Table 5.3 in Rosenshine, 1980). Not only was the allocated time substantially higher for the three high teachers than it was for the three low teachers, the engaged rate was higher for those teachers who allocated the greatest amount of time to academic instruction. Furthermore, the pattern was consistent for both reading and mathematics.

Table 2
Differences in Academic Engaged Minutes in Highest, Average and Lowest Classrooms

	Reading			Mathematics			Total	
	Allocated	Engagement rate	Engaged minutes	Allocated	Engagement rate	Engaged minutes	Allocated time	Engaged minutes
				Second grade				
High3	1'45"	81%	1'25"	35"	82%	30"	2'20"	1'55"
Average	1'30"	73%	1'04"	36"	71%	26"	2'06"	1'30"
Low 3	1'00"	72%	43"	30"	75%	22"	1'30"	1'05"
				Fifth grade				
High 3	2'10"	80%	1'45"	53"	86%	45"	3'03"	2'30"
Average	1'50"	74%	1'20"	44"	74%	35"	2'25"	1'55"
Low 3	1'25"	63%	1'05"	38"	63%	22"	2'03"	1'25"

*Adapted from Rosenshine (1980).

5. Karweit and Slavin (1981) found a range of scheduled time in mathematics in 18 second to fifth-grade classes in the same district of from 240 to 300 minutes with a mean of 269 minutes. Of the scheduled time, 176 to 308 minutes (a mean of 239 minutes) were *actually* allocated to teaching. Of that time, 142 to 290 (a mean of 217) minutes were used in mathematics instruction. (Table 3)

The engaged time ranged from 134 to 244 minutes with a mean of 183. Thus, the time lost each week between allocated and engaged time was a mean of 86 minutes, with a range of from 56 to 140 minutes.

Table 3*
Scheduled, Actual, and Instructional Time for Elementary School Mathematics

	Scheduled Minutes	Actual Minutes	Instructional Minutes	Engaged Minutes	Lost Minutes
Mean	269	239	217	183	86
Range	240-300	176-308	142-290	134-244	56-140

*Adapted from Karweit and Slavin (1981).

Several authors have reported classroom time by process categories. At perhaps the simplest level, Rosenshine (1980) divided time into teacher-led and seatwork categories. Within these two categories, Rosenshine noted that engaged percentage rate was higher for teacher-led portions of the program (the low eighties) than for seatwork (approximately 70 percent). DeVault (1977) analyzed classroom time in three subject areas: (1) language, (2) arts, and (3) mathematics and in four categories (1) supervised whole class, (2) supervised subgroup, (3) supervised individual, and (4) unsupervised individual. Stallings (1980) used an even more complex set of process categories with which to analyze reading instruction.

One of the more important concepts within the time-to-learn structure is the way in which time gets subtracted from the maximum time available by the various actors—administrators, teachers, and pupils (students). Although relatively less research effort has been devoted to studying this dimension, there are some useful studies. Again, at the simplest level, Rosenshine (1980), reporting data from the BTES, gave two different sorts of nonengaged time: (1) interim and wait, and (2) off-task. From the BTES data, Rosenshine concluded that a certain amount of "interim and wait" time is a fact of life in all classrooms, even the most efficient. This conclusion was based on the observation that time lost for this reason was very similar across "high, "average" and "low" classrooms. On the other hand, Rosenshine noted that the amount of off-task time varies considerably from one classroom to another. Thus, it would appear that changing the instruction and management processes may result in more engaged time, not necessarily through reduction of interim and wait time, but through reduction of off-task time.

Karweit and Slavin (1981) separated the time lost into that which is lost

by (1) intrusion, (2) procedure, and (3) inattention. "Intrusion" is time lost to external forces. For example, in one school, math instruction occurred just before lunch, and several minutes were lost from mathematics instruction each day to permit the children to be lined up for lunch. "Procedure" is time lost by such classroom procedures as handing in assignments, picking up books, and taking roll. "Inattention," of course, is the pupil focusing on something other than the lesson. Karweit and Slavin reported an average of 30.5 minutes lost per week due to intrusion, 20.6 due to procedure, and 34.0 due to inattention for a total average loss of 85 minutes from the 269 minutes available for instruction. Of course, as mentioned above, the range of time lost varied substantially from one classroom to another. Furthermore, the time lost for each of the three causes also varied considerably—from zero to sixty-four minutes per week for intrusion, from four to thirty-two minutes for procedures, and from eighteen to fifty-seven minutes for inattention. It is of at least passing interest to note that the classroom that had the highest loss from intrusion also had the highest loss from procedures and the third (of twelve) highest loss from inattention.

The Mid-continent Regional Educational Laboratory (McREL) (1983) has developed a comprehensive scheme for representing the total time available for the school and then subtracting the amounts of time that disappear, leaving as a remainder the time available for student learning. Table 4 contains a comparative summary of the concepts involved in the Rosenshine, Karweit and Slavin, and McREL reports.

Table 4
Summary of Concepts on How Time is Lost
Terms Used in Different Sources

	Concept		
	Administrator Subtraction	**Teacher Subtraction**	**Student Subtraction**
Rosenshine		Interim & Wait	Off-task
Karweit & Slavin	Intrusion	Procedure	Inattention
McREL	Non-Academic Building Activities	Non-Academic Class Activities	Student Iattentiveness

Uses of the Time to Learn Concept

Time to Learn and Achievement

One of the key questions that researchers have asked about time is, "What is the relationship between how class time is spent and student achievement gains?" This broad question has at least two sub-issues. The first issue is the relationship between the allocation of time and student achievement; the second issue is the relationship between specific choices that teachers make about the use of allocated time and student achievement.

As previously noted, the most influential and widely cited study about the relationship of achievement to the allocation and use of time is the Beginning Teacher Evaluation Study (BTES). As a part of that study, a sample of students in the second grade and the fifth grade were administered a battery of achievement tests; they were observed one full day per week for 20 weeks by trained observers and their teachers kept a log of allocated time, per content category, for all school days between October and May. The project staff also gathered data on such activities as teacher planning functions and an assessment of general characteristics of the classroom and instructional program. Based on an analysis of the data, the BTES project researchers reported fourteen findings; five of those findings address the issue of the relationship of academic learning time and achievement. They are:

1. The amount of time that teachers allocate to instruction in a particular curriculum content area is positively associated with student learning in that content area.
2. The proportion of allocated time that students are engaged is positively associated with learning.
3. The proportion of time that reading or mathematics tasks are performed with high success (Academic Learning Time) is positively associated with student learning.
4. The proportion of time that reading or mathematics tasks are performed with low success is negatively associated with student learning.
5. Increases in Academic Learning Time are not associated with more negative attitudes toward mathematics, reading, or school.

BTES researchers concluded that Academic Learning Time is an important predictor of student achievement, and that Academic Learning Time can be interpreted as "an immediate, ongoing measure of student learning" (Fisher et al., 1980; Marliave, 1978).

Other researchers have also studied the way time is used in classrooms. At the elementary level, Cornbleth and Korth (1979) examined the relationship between subject area, day of the week, activity format, and previous student achievement growth in fourth-grade classrooms across four subject areas. They found differences in involved time for subject area, day of the week, and achievement growth. Gettinger and White (1979) also found a strong correlation between time to learn and achievement in several subject

areas. At the secondary level, researchers have examined how time is used and the effects of such use at several grade levels and in multiple subject areas. Halasz and Behm (1983) assessed how time was used in three vocational education areas, providing baseline for further research in that field. Others have examined time on task in junior high and high school level mathematics (Seifert & Beck, 1983; Sanford & Evertson, 1982; Fitzgibbon & Clark, 1982; Probst, 1980); science (Deady, 1970; Burkman et al., 1981; Beasley, 1982; Dilleshaw & Okey, 1983); and physical education (Godbout et al., 1983).

In general, studies support a correlation between time on task and student achievement, although there appears to be variation by subject matter. For example, Sanford and Evertson (1982) found a significant relationship between time use and class achievement and attitude in junior high school mathematics classes, but not in English classes. They hypothesized that the reason for such a discrepancy is that there is more agreement and consistency about the content taught and appropriate instructional techniques in mathematics than in English, and that it is therefore possible to identify classroom-activity variables that contribute to mathematics learning. In the English classes that they studied, there was such a wide variation in goals and activities that the activity categories used in the study failed to describe some of the salient dimensions.

On the other hand, studies other than BTES which focus upon allotted time rather than engaged time show mixed results or no correlation with achievement. For example, Deady (1970) examined the effects of increased time allotments in science for fourth-grade students from 20 minutes/day to 35 minutes/day, and found no significant differences in achievement or attitude toward science that could be attributed either to time allotment or teacher preference for time allotment. Smith (1979) found that time allocated for social studies showed a very slight correlation with fifth graders' achievement, and suggested that allotted time should be carefully qualified when used as a variable in assessing instruction.

Several studies have considered the relationship of time on task to ability levels of students. Probst (1980) investigated differences occurring in time utilization by students of varying achievement levels in three mathematics teachers' classes, each of which varied in instructional mode, and found that high and middle achievers spent significantly more time on task than low achievers, and that in some cases there were significant differences in the level of time on task of students of similar ability levels in different classes. In an earlier study of time allotments by subjects in intermediate elementary grades, it was found that maximum period lengths resulted in greater achievement in every area tested for those with IQs of 115 or more; for those with lower IQ scores, longer periods resulted in significantly higher achievement only in the areas of mathematics and language (Jarvis, 1962). Good and Beckerman (1978) investigated whether pupil involvement in tasks was different for high, middle, and low achievers, and found that high achievers were more involved than low achievers, that there were different patterns of

pupil involvement in different teachers' classrooms, and that the achievement gap became greater between high achievers and low achievers in the traditionally emphasized subjects.

Other studies have focused more specifically on the instructional techniques used in the classroom. Seifert and Beck (1983) found a positive correlation of both achievement gains and time on task with the lecture/ discussion strategy in algebra. Roadrangka & Yeany (1982) observed five student teachers, rating them according to instructional style (direct to indirect), quality of teaching strategies, developmental level, and time on task; they concluded that the type of strategy and the quality of the strategy have an influence on student time on task, and that there is a relationship between formal reasoning ability and time on task. Beasley (1982) observed 24 science teachers and categorized their instructional strategy into three types of instruction (exposition, exposition plus props, and demonstration); demonstration was used less frequently, but task involvement increased in the demonstration lesson segments.

The wide range of results of the studies cited above and others which examine factors related to time on task and achievement illustrate the difficulty of examining single or limited numbers of variables. A few studies, like BTES, have examined multiple variables. For example, Wilson et al. (1983) examined the effects of task arrangements and management systems on student engagement rates. They argue that the complexity of classroom arrangements influences the form and content of management systems, and that management decisions impact levels of student engagement. Such a position is congruent with Berliner's (1982) conception of the executive functions of teaching; like business executives, teachers must manage many complex tasks in a work setting in order to achieve the desired outcomes.

Time as a Mechanism for Studying other Topics

Time for learning is an important concept in itself, but it also has become a mechanism for studying other dimensions of the educational experience.

1. Collective Bargaining—Eberts and Pierce (1982) studied the possible effect of collective bargaining on time use. Based on a national survey of more than 3,000 elementary school teachers, they found that teachers covered by collective bargaining spent approximately three percent less time in instruction per day, or more than five days less in an 180 day school year. When related back to the Wiley-Harnischfeger model, this has potentially important achievement implications.
2. Bilingual Education—Ortiz (1980) studied a number of bilingual education projects, examining the proposals as well as observing in some projects. The proposals reflected relatively greater concern with staffing, materials, and teaching strategies and less with classroom management, teacher expectations and academic learning time. In at least one project, teacher-pupil interaction with bilingual students was reduced when bilingual aides were in the classroom. Teachers tended to initiate interaction with non-bilingual students; aides, with bilingual

students. This, and other practices, resulted in lower academic learning time for the bilingual students and seemed to lead to some classroom management problems.

3. Mainstreamed Children—Knowles (1982) conducted research on the academic learning time of handicapped and nonhandicapped students in mainstreamed elementary physical education classes. She found that both handicapped and nonhandicapped children had a significantly greater amount of academic learning time in individualized learning settings.
4. High and Low Achieving Children—Derevensky et al. (1981) found that high achieving inner city children spent significantly more time on task than did low achieving children; the time spent on learning was relatively high for both groups.
5. Minority and Disadvantaged Children—In a study of the opportunity given low income minority students to respond, Stanley and Greenwood (1983) learned that academic responding time was significantly lower among minority students in Title I schools. Gross (1983) reported four schools that were committed to raising achievement scores for disadvantaged students by increasing academic learning time.
6. Nontraditional Settings—Based upon data collected from observing twelve and thirteen year olds in a participatory museum exhibit, Falk (1983) concluded that time on task behavior provides a feasible basis for predicting learning.
7. Good and Poor Readers—Allington (1982) analyzed teacher logs for 600 elementary reading group sessions, and found that although teachers allocate the same amount of time for reading instruction for good and poor readers, the good readers are allowed to cover much more material in the same amount of time. Allotted time, while an appropriate initial measure of how time is distributed in the instructional program, does not indicate whether allocated time is actually used for its allocated purpose, or if it is, if it is used differentially among students.

Methodology and Criticism

Among the more perplexing aspects of research on academic learning time are those associated with observation methodology. Questions arise regarding how to decide whether a student is on or off task, which students should be sampled when observations are being made, how many students should be sampled, when observations should be made, and how long the observations should be. Although such questions have not been answered definitively, there are some useful preliminary results. The most systematic methodological study appears to have been one conducted by Karweit and Slavin (1981, 1982), in which they observed 18 second- to fifth-grade classrooms in a rural Maryland district. They considered the timing of obser-

vations, sampling of students and segments of instruction, and definitions of on-task behaviors. In this study, Karweit and Slavin found that altering the definition of time-on-task to classify momentary (less than one minute) off-task behaviors as being on-task, resulted both in classifying more behavior as being on-task and in slightly bettering the ability of on-task behavior to account for variation in posttest achievement test scores; however, the point that they make is not that there is increased ability to predict but that, because any methodological change could affect outcomes, all methodological decisions should be made on a rational rather than an arbitrary basis.

Karweit and Slavin also found that there is variation, by teacher, in the engagement rate for different ten-minute segments of a fifty-minute period. That is, where one teacher's engaged rate may be highest at the beginning of a class period, another one may peak during the third segment, and a third one, during the final segment. Furthermore, the higher the percent of the class period observed, the better was the prediction of achievement test scores.

Further analyses of their data by Karweit and Slavin revealed that both increased observation reliability and better prediction from the observations resulted as the number of fifty-minute observation periods was increased from five to nine to eighteen. On the other hand, there were only minor, nonsignificant differences between February (semester beginning) and May (semester ending) observations. Nor did reducing the number of students monitored from 12 to 6 make much difference. An even further reduction to three in number of students observed appeared to be tolerable if there were at least eight to ten observation periods. This study provides strong evidence of the care that must be taken in planning and conducting time-on-task observations for both classroom planning and research purposes.

Despite the generally positive response to the time for learning concept and its underlying research base, this relatively new field is not without its critics. Five kinds of criticism have been made: (1) the research methodology is inadequate (McNamara, 1981), (2) the relationships between time-on-task and achievement are too weak to justify modifying programs in an attempt to increase time-on-task (McNamara, 1981), (3) use of achievement tests as the primary outcome measure for education will bring an unfortunate narrowing of the curriculum (McNamara, 1981), (4) traditional methods texts and courses give a more sensitive and comprehensive treatment to issues related to attention (time-on-task) (McNamara, 1981; Confrey, 1982), and (5) there are problems in estimating time-on-task that are difficult to solve (Karweit & Slavin, 1982). McNamara (1981) is especially harsh in his analysis of the BTES methodology and what he considers inappropriately prescriptive procedures that various authors have projected from the data.

Implications for Practice

Despite the critics, there has been a considerable amount of interest in discovering ways in which the time on task concepts can be used for

the improvement of education. The recommendations fall into three categories:

1. *School policies/leadership for effective use of time.* One of the consistent findings in studies of time utilization is that there is wide variation in the amount of the school day devoted to instruction, the amount of instructional time that is actually engaged time, and the amount of engaged time which is academic learning time. Many of the recommendations have therefore focused on increasing awareness of how time is used and planning for its more effective use. In the area of non-instructional time, schools have been encouraged to gather data and examine their policies on such time-related factors as length of the school year and school day; how time is scheduled within the school day; breaks, announcements, special events, and other potentially schedule-disrupting events; and program decisions such as the use of "pull-out" programs or special instructional programs for some children. The intent of such analyses should be to increase the amount of time which becomes available at the classroom level for instructional use (AASA, 1982; McREL, 1983). Stallings and Mohlman (1981), in a study of the impact of school policy on effective utilization of time, found that the role of the principal was critical; time-on-task improved and attitudes were more positive in schools where policies and rules were clear and consistent, where there was administrative support and fewer burdensome duties, and where the principal was collaborative, respectful, and supportive. Harnischfeger (1980), while supporting the position that research on issues such as time on task can make major contributions to policy development for school improvement, also expressed concern that policy issues typically enter the thinking of researchers only after the completion of a study rather than when the research problem and the design are being formulated. She recommends that policy issues be considered early in the definition of a research or development effort.
2. *Analysis of time on task in the classroom.* A second category of recommendations in the time on task literature focuses on how effectively that time is used. When academic learning time is considered, recommendations shift from the time on task research to a broader research base which includes alternative models of learning, assumptions about curricular and instructional goals and values, and research on classroom management. (See papers by Stallings and Bruning, this volume.)

DISCUSSION

The Beginning Teacher Evaluation study and the related research by Carroll, Harnischfeger and Wiley, Evertson and Sanford and others have generated a high level of interest in the issue of time utilization and how

such utilization affects student achievement. Perhaps the most important contribution that such research has made is that it has caused educators to think about what happens in schools in a new way; time is now seen as a variable which can be manipulated rather than as a "given," part of the general context in which schools operate.

At the same time, there is some concern that the findings of BTES and the related studies will be treated as prescriptions rather than as a broad descriptive base that educators can use to analyze their own classrooms and schools and make decisions about curriculum and instruction. Several researchers have offered cautions about the data base, the assumptions, and the generalizability of the data produced thus far, and express the fear that time on task may be treated as a simplistic notion, rather than as a complex phenomenon which warrants careful interpretation before application.

How might the research on time on task be useful to the individual classroom teacher or to a school? For the teacher, the research provides both a methodology and a construct for understanding what is taking place in his or her classroom. The data generated by keeping logs of time allocation and conducting time on task "audits" of individual students in different subject areas and instructional activities can serve as one tool to assist teachers in understanding the consequences of current practice and to adapt their instruction, if desired. For school building staffs or for school districts, the time on task concept and instruments can be a means of generating data for policy formulation and guidelines about how time is allocated, and what kinds of activities may cut into the time allocated for instruction.

It may be important, however, to be aware of the ways in which the time on task concepts and data gathering techniques should *not* be used. Time on task is not a prescriptive device, and there is no simple "right" level of allocated learning time that should be present in every classroom. It might be very tempting for teachers or administrators to assume that more is always better, and to focus on counting time on task rates rather than the interrelationship between time utilization and instructional goals and alternative strategies. Time-on-task is also not an evaluation tool, and should not be used as a means of rating teachers.

How might the time on task research be useful to teacher educators as they prepare teachers? There are several concepts both explicit and implicit within that body of research which preservice teachers need to understand. First, a teacher has only a finite block of time within which to teach. Prospective teachers need to understand how time gets subtracted from that initial block of time, through such factors as absences, "snow days," interruptions from announcements and loudspeakers, the need for discipline, and other intrusions. They also need to realize how time becomes lost within the instructional process, to understand ways in which time is used profitably, and to know how they can make decisions which will increase the amount of learning time in their classrooms.

There needs to be explicitness in presenting these concepts to preservice teachers; they need concrete descriptions, as much detail as possible, and

opportunities to use the concepts in practical settings. At the same time, teacher educators, like the school personnel, need to be careful that the time on task research does not get used prescriptively by preservice teachers. There is a great temptation to "count minutes" and equate on-task as good and off-task as bad. As several of the studies cited have shown, some off-task time is both necessary and inevitable.

Time-on-task research must be integrated with other forms of research in teacher education programs. In this document there are six papers on specific research topics, of which this paper is one. Each of the other topics has a relationship to time on task. The literature on classroom management, for example, must be considered when one is making decisions about the use of time. (See paper by Vasa, this volume.) If a teacher has decided that although she knows the highest attention rate is usually found in teacher-led presentations and that lower attention rates usually occur during seatwork, she still wants to use seatwork because of a particular goal, she may benefit from the advice that the management literature gives her on assigning seatwork, giving directions, and managing transitions. As another example, a teacher who understands the developmental characteristics of students may make different choices about time allocation and instructional strategies than one who has not considered the two bodies of research in relationship to each other. (See paper by Santmire and Friesen, this volume.)

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